

WHAT IS CLAIMED IS:

- 2 1. A microfluidic device for assaying a liquid biological sample of 20 μ L or
less comprising:
 - 4 (a) an inlet port for receiving said sample;
 - 6 (b) a capillary passageway in fluid communication with said inlet port;
 - 8 (c) an inlet chamber in fluid communication with the capillary passageway of
(b), thereby permitting said sample to flow into said inlet chamber, said inlet chamber
containing means for uniformly distributing said sample across said chamber and,
displacing air from said chamber; and
 - 10 (d) at least one vent passageway for removing air displaced by said liquid
sample.
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- 14 2. A microfluidic device of Claim 1 wherein said means for uniformly
distributing said sample is at least one groove extending across said inlet chamber.
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- 18 3. A microfluidic device of Claim 1 wherein said means for uniformly
distributing said sample is at least one weir extending across said inlet chamber.
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- 22 4. A microfluidic device of Claim 2 or 3 wherein said at least one groove or
at least one weir contains wedge-shaped cutouts to facilitate uniform flow of said
sample.
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- 26 5. A microfluidic device of Claim 1 wherein said means for uniformly
distributing said sample is a microstructure comprising an array of posts disposed across
said inlet chamber.
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- 30 6. A microfluidic device of Claim 5 wherein said posts contain wedge-
shaped cutouts to facilitate uniform flow of said sample.
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- 34 7. A microfluidic device of Claim 1 wherein said inlet port is tapered to
engage the corresponding shape of a pipette for depositing said sample
- 36 8. A microfluidic device of Claim 1 further comprising an blood anti-
coagulant deposited in said inlet chamber.

2 9. A microfluidic device of Claim 1 further comprising an overflow chamber
in fluid communication with said inlet chamber, said overflow chamber for receiving
4 said sample in excess of the amount needed to fill said inlet chamber.

6 10. A microfluidic device of Claim 9 wherein said overflow chamber contains
an indicator to detect the presence of excess of said sample.

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10 11. A method of supplying liquid to a microfluidic device having an inlet port
in fluid communication with an inlet chamber via a capillary passageway, said method
comprising.

12 (a) introducing a portion of said liquid into said inlet port;
14 (b) transferring by positive pressure or capillary forces said liquid portion of
(a) to said inlet chamber via said capillary passageway;
16 (c) distributing said liquid portion of (a) uniformly across said inlet chamber
and purging air from said chamber completely.

18 12. A method of Claim 11 wherein excess of said sample is diverted to an
overflow chamber after said inlet chamber is filled.

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22 13. A method of Claim 12 wherein the presence of said excess is detected by
an indicator in said overflow chamber.